A2T Q1 Exam 2 Review Key

1) $\sqrt{-18x^3y^4}$

$\sqrt{-9x^2y^4}\sqrt{2x}$

$3ixy^2\sqrt{2x}$

D

2) $\sqrt{-12}$

$\sqrt{-4}\sqrt{3}$

$2i\sqrt{3}$

3) $\frac{1}{3}\sqrt{-144}$

$\frac{1}{3}(12i)$

$4i$

4) $\sqrt{-18} + \sqrt{-72}$

$\sqrt{-9}\sqrt{2} + \sqrt{-36}\sqrt{2}$

$3i\sqrt{2} + 6i\sqrt{2}$

$9i\sqrt{2}$ A

5) $\frac{\sqrt{-50}}{\sqrt{2}} = \sqrt{-25} = 5i$ C

6) $3\sqrt{-27} + 4\sqrt{-48}$

$3\sqrt{-9}\sqrt{3} + 4\sqrt{-16}\sqrt{3}$

$3\cdot 3i\sqrt{3} + 4\cdot 4i\sqrt{3}$

$9i\sqrt{3} + 16i\sqrt{3}$

$25i\sqrt{3}$

7) $(3i)(6i)$

$18i^2$

$18(-1)$

-18

8) $\frac{3}{2i}\cdot\frac{i}{i} = \frac{3i}{2i^2} = \frac{3i}{2(-1)}$

$\frac{3i}{-2}$

9) $3\sqrt{-32} - \sqrt{-8}$

$3\sqrt{-16}\sqrt{2} - \sqrt{-4}\sqrt{2}$

$3\cdot 4i\sqrt{2} - 2i\sqrt{2}$

$12i\sqrt{2} - 2i\sqrt{2}$

$10i\sqrt{2}$

10) $2i^8$ $4\overline{)8}^{2.0}$

$2(1)$

2

11) $(5i^3)^3$ $i^9 = i$

$125i^9$

$125i$ C

12) i^{99} $99 \div 4 = 14.75$

$i^3 = -i$

B

13) $i^{27} + i^{34}$

$i^3 + i^2$

$-i + -1$

$-i - 1$ (A)

14) $i^{303} = i^3 = \boxed{-i}$

$303 \div 4 = 75.75$

15) $-a - bi$ [C]

16) $(a+bi) + (a-bi) = 2a$

"a" is real

[B]

17) $(5-3i) + (3 \ominus 2i)$ (conjugate)

$= \boxed{8-5i}$ (C)

18) $(6 - 2i\sqrt{6}) - (4 + 4i\sqrt{6})$

$\boxed{2 - 6i\sqrt{6}}$

19) $(2+i)^2 = (2+i)(2+i)$

$4 + 2i + 2i + i^2$

$4 + 4i + (-1)$

$\boxed{3+4i}$ (A)

20) $(-4-7i)(-4+7i)$

$16 - 28i + 28i - 49i^2$

$16 - 49(-1)$

$16 + 49 = \boxed{65}$ (D)

21) $\frac{1}{3-2i} \cdot \frac{3+2i}{3+2i} = \frac{3+2i}{9-4i^2} = \frac{3+2i}{9+4} = \boxed{\frac{3+2i}{13}}$

22) $(2+i)(3-6i) = 6 - 12i + 3i - 6i^2 = 6 - 9i + 6 = \boxed{12 - 9i}$

23) $\underbrace{(3+2i)(3-2i)}_{\text{First}}(1+i^2)$

$9 - 6i + 6i - 4i^2$

$9 + 4$

$13 \quad (1+i^2)$

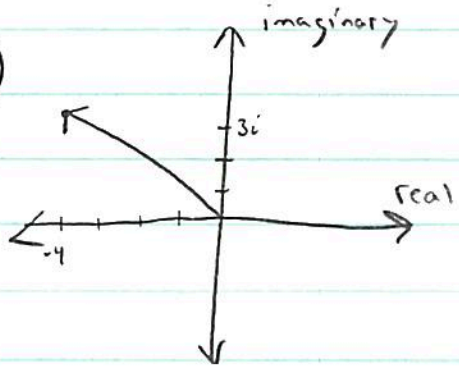
$13 + 13i^2$

$13 - 13 = \boxed{0}$

24) $\frac{1}{3-i} \cdot \frac{3+i}{3+i} = \frac{3+i}{9-i^2} = \frac{3+i}{9+1} = \boxed{\frac{3+i}{10}}$

(B)

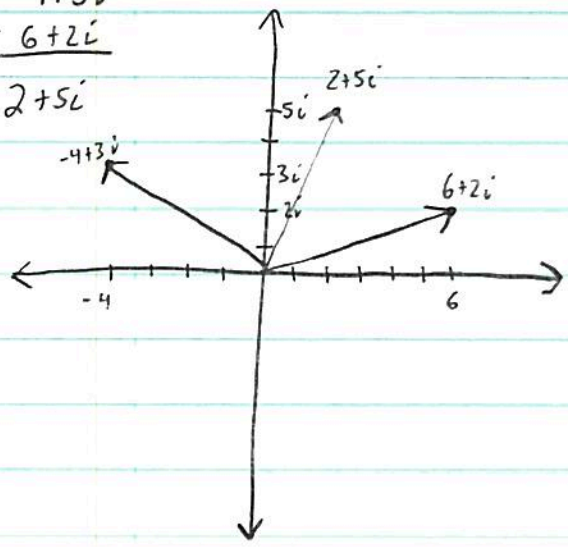
25)



26) $-4+3i$

$+ \ 6+2i$

$2+5i$



27) $|5+12i| = \sqrt{5^2+12^2}$

$= \sqrt{25+144}$

$= \sqrt{169}$

$= \boxed{13}$ (D)

28) $\left|\frac{\sqrt{2}}{2} + \frac{\sqrt{2}}{2}i\right| = \sqrt{\left(\frac{\sqrt{2}}{2}\right)^2 + \left(\frac{\sqrt{2}}{2}\right)^2}$

$= \sqrt{\frac{\sqrt{4}}{4} + \frac{\sqrt{4}}{4}} = \sqrt{\frac{2}{4}+\frac{2}{4}} = \sqrt{\frac{4}{4}}$

$= \sqrt{1} = \boxed{1}$ (A)

29) $4x^{\frac{1}{5}} + 2 = 10$

$-2 \quad -2$

$\frac{4x^{\frac{1}{5}}}{4} = \frac{8}{4}$

$x^{\frac{1}{5}\left(\frac{5}{1}\right)} = 2^{\frac{5}{1}}$

$x = 2^5$

$\boxed{x = 32}$

30) $a^{-\frac{1}{3}} - 1 = 2$

$+1 \quad +1$

$a^{-\frac{1}{3}\left(\frac{-3}{1}\right)} = 3^{\left(\frac{-3}{1}\right)}$

$a = 3^{-3}$

$a = \frac{1}{3^3}$

$\boxed{a = \frac{1}{27}}$

31) $16^{x-1} = 8^x$

$\left(2^4\right)^{x-1} = \left(2^3\right)^x$

$2^{4x-4} = 2^{3x}$

$4x-4 = 3x$

$-4x \quad -4x$

$-4 = -x$

$\boxed{x = 4}$ (C)

32) $27^{2x+1} = 9^{4x}$

$\left(3^3\right)^{2x+1} = \left(3^2\right)^{4x}$

$3^{6x+3} = 3^{8x}$

$6x+3 = 8x$

$-6x \quad -6x$

$\frac{3}{2} = \frac{2x}{2}$

$\boxed{x = \frac{3}{2}}$

33) $3^{x+1} - 5 = 22$

$+5 \quad +5$

$3^{x+1} = 27$

$3^{x+1} = 3^3$

$x+1 = 3$

$-1 \quad -1$

$\boxed{x = 2}$

34) $\frac{\sqrt[3]{25}}{\sqrt[3]{16}} \cdot \frac{\sqrt[3]{4}}{\sqrt[3]{4}} = \frac{\sqrt[3]{100}}{\sqrt[3]{64}} = \frac{\sqrt[3]{100}}{4}$ (B)

35) $6\sqrt{54} - 3\sqrt{24} - 8\sqrt{96}$

$6\sqrt{9}\sqrt{6} - 3\sqrt{4}\sqrt{6} - 8\sqrt{16}\sqrt{6}$

$6 \cdot 3\sqrt{6} - 3 \cdot 2\sqrt{6} - 8 \cdot 4\sqrt{6}$

$18\sqrt{6} - 6\sqrt{6} - 32\sqrt{6}$

$-20\sqrt{6}$ (B)

36) $(-3x^2y^3)^3$

$(-3)^3 x^6 y^9$

$-27x^6y^9$ (D)

37) $\left(-\frac{2x}{z^2}\right)^3 = \frac{(-2)^3 x^3}{z^6} = \frac{-8x^3}{z^6}$

38) $8^{\frac{2}{3}} = \sqrt[3]{8^2}$ (A)

39) $\left(\frac{8}{27}\right)^{-\frac{2}{3}} = \left(\frac{27}{8}\right)^{\frac{2}{3}} = \frac{\left(\sqrt[3]{27}\right)^2}{\left(\sqrt[3]{8}\right)^2} = \frac{3^2}{2^2} = \frac{9}{4}$ (B)

40) $(2y)^{\frac{2}{5}} = \sqrt[5]{(2y)^2} = \sqrt[5]{4y^2}$ (C)